

EPA Superfund
Record of Decision:

TAYLOR ROAD LANDFILL
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RECORD OF DECISION

TAYLOR ROAD LANDFILL
SUPERFUND SITE

Hillsborough County, Florida

Prepared By:

Environmental Protection Agency
Region IV

Atlanta, Georgia

**RECORD OF DECISION
TAYLOR ROAD LANDFILL SUPERFUND SITE**

DECLARATION

SITE NAME AND LOCATION

Taylor Road Landfill Superfund Site
Hillsborough County, Florida

STATEMENT OF BASIS AND PURPOSE OF RECORD OF DECISION

This decision document presents the selected remedial action for the Taylor Road Landfill Superfund Site, Hillsborough County, Florida, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record file for this site.

The State of Florida, as represented by the Florida Department of Environmental Protection (FDEP), has been the support agency during the Remedial Investigation and Feasibility Study process for the Taylor Road Landfill site. As the support agency, FDEP has provided input during the process, in accordance with 40 CFR 300.430. Based upon comments received from FDEP, it is expected that concurrence will be forthcoming; however, a formal letter of concurrence has not yet been received.

ASSESSMENT OF THE SITE

If not addressed by implementing the response action selected in this Record of Decision (ROD), actual or threatened releases of hazardous substances from this site may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This remedy is the final action for the site. The function of this remedy is to reduce the risks associated with potential exposure to contaminated ground water in the Floridan aquifer.

The major components of the selected remedy to be implemented include:

- The use of existing and future institutional controls to restrict construction of new potable-water wells that would extract water affected by the Taylor Road Landfill
- Modification of the existing County ground water-monitoring program to include quarterly monitoring of a "ring" of existing and future monitor wells placed with the objective of better defining and enclosing the area of ground water exceeding the Florida Primary and Secondary Drinking Water Standards and Minimum Criteria
- Provision of County water service to human receptors (about 20 residences) within a "ring" of monitor wells and within a "buffer zone" that extends 270 ft outward from the "ring"
- Contingent expansion of monitor well "ring" and provision of County water to

additional receptors

- Natural Attenuation with contingent corrective action if monitoring reveals that it is needed

STATUTORY DETERMINATION

The selected remedy is protective of human health and the environment, is cost effective, and complies with federal and state requirements that are legally applicable or relevant and appropriate to the remedial action. Because of site-specific conditions, EPA used the flexibility provided in the NCP to set the point of compliance with ground water Maximum Contaminant Levels at the perimeter of an area containing all three of the adjacent Study Area landfills. Landfill waste will be left in place; therefore, this remedy does not satisfy the statutory preference for treatment as a principal element.

Because this remedy will result in hazardous substances remaining on-site in levels above health-based limits, a review will be conducted within 5 years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Richard D. Green
Associate Director of Superfund
and Emergency Response,
U.S. Environmental
Protection Agency,
Region IV

Date

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RECORD OF DECISION

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION FOR THE TAYLOR ROAD LANDFILL SUPERFUND SITE, HILLSBOROUGH COUNTY, FLORIDA

This decision document presents the selected remedial action for the Taylor Road Landfill Site (the Site), in Hillsborough County, Florida, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, with the National Contingency Plan (NCP). This decision is based on the Administrative Record for the Site.

1.0 SITE LOCATION AND DESCRIPTION

The Site is located in eastern Hillsborough County, Florida, on County-owned property, approximately 7 miles east of Tampa in the Seffner-Thonotosassa area (see Figure 1.1). Interstate 4 borders the Site to the south, and Mango Road (State Route 579) borders the site to the west (see Figure 1.2). The County property is 252 acres in size and contains three closed landfills (Figure 1.2).

The 42-acre Taylor Road Landfill is located east of the 10.6-acre Florida Department of Transportation (FDOT) Borrow Pit Landfill and southeast of the 64-acre Hillsborough Heights Landfill. Only the Taylor Road Landfill is on the National Priorities List (NPL). However, ground water contamination has moved well beyond the boundaries of the Taylor Road Landfill. Accordingly, the two adjacent landfills were evaluated during the Remedial Investigation/Feasibility Study (RI/FS) to determine if they are contributing to ground water contamination. Also within the 252 acres are five stormwater-retention basins, County maintenance facilities, and a community recycling collection center/refuse collection area. In the RI/FS, the entire 252 acres of County property, containing all three landfills, is referred to as the "Study Area."

The land surrounding the landfills serves a variety of uses, including residential, commercial, and agricultural uses. The majority of area residents use well water.

2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

2.1 LANDFILL OPERATION

The three landfills were developed sequentially. The first, known as the Taylor Road Landfill, had been an FDOT borrow pit until it was permitted as a solid waste landfill for Hillsborough County in 1975. The Taylor Road Landfill was not constructed with a liner or leachate collection system. From May 1976 until February 1980, the County operated the Taylor Road Landfill, which was intended for the disposal of residential, commercial, and industrial refuse. A total of 620,000 tons was disposed of in the landfill. An unknown quantity of hazardous waste is suspected to have been buried at this landfill. In the late 1970s, two events precipitated the development of capacity problems within the Taylor Road Landfill. One of these events was the settling of a legal dispute with EPA by the City of Tampa, during which the city agreed to close its incinerator by January 1, 1980. This event diverted an estimated 790 tons of refuse per day to the Taylor Road Landfill. At the same time, another local landfill was closed, adding 490 tons of solid waste per day to the Taylor Road Landfill disposal load. Because of

the discontinuation of the incinerator operation, waste generated from area hospitals, clinics, and other health providers also began to be buried at the Taylor Road Landfill.

In February 1980, the Taylor Road Landfill reached its capacity, and landfill operations were moved to an adjacent 10.6-acre parcel known as the FDOT Borrow Pit Landfill. The Borrow Pit Landfill was developed to operate as a high-rise sanitary landfill for residential, commercial, industrial, and agricultural wastes; dead animals; and water treatment sludge. The Borrow Pit Landfill was constructed with a liner and a leachate collection system, and was operated by Waste Management, Inc., of Florida. The Borrow Pit Landfill was to serve as a temporary site, pending the design, permitting, and construction of a proposed 200-acre landfill on the adjacent property to the north. A total of 320,000 tons of waste was disposed of in the Borrow Pit Landfill.

The application to extend the Taylor Road Landfill was met by strong public opposition from a neighborhood group, later organized as the Taylor Road Civic Association (TRCA). The organization's petition to FDER (subsequently renamed FDEP) charged that the County failed to properly maintain the Site.

On January 21, 1980, FDER initially approved the permit with certain caveats, including FDER's warning that landfilling operations could not proceed should any determination be made that ground water was being contaminated by the existing Taylor Road Landfill or the Borrow Pit Landfill. Ultimately, however, FDER rejected the 200-acre landfill expansion project, resolving that no guarantee of an environmentally safe operation could be given, and that additional wastes deposited on the site would add to the existing potential hazards.

The County continued to use the Borrow Pit Landfill until October 1980, when waste disposal operations were transferred to a third, 64-acre, property located north and west of the two previous landfills. This property, known as the Hillsborough Heights Landfill, was constructed and operated by Waste Management, Inc., of Florida.

The Hillsborough Heights Landfill was opened under emergency order by FDER, and occupied a portion of the 200 acres that FDER previously had rejected. In the landfill's early months of operation, infectious wastes from hospitals, clinics, laboratories, and doctors' offices were among the refuse disposed of there. The landfill remained open for 4 years, until October 1984, when land disposal of wastes in that area of Hillsborough County was discontinued. The Hillsborough Heights Landfill was constructed with a liner and a leachate collection system. Approximately 3,500,000 tons of waste was disposed of in the Hillsborough Heights Landfill.

2.2 REGULATORY RESPONSE

In October 1979, as part of a nationwide program of ground water sampling and analysis, EPA tested monitor wells and private wells in the Taylor Road Landfill Site area. Results of the sampling revealed the presence of volatile organic compounds (VOCs) and metals contamination in site monitoring wells and numerous private wells. The highest contaminant concentrations were found within the site. Subsequently, EPA advised residents in the immediate vicinity of the site to discontinue use of their wells. The County established a program of bottled-water delivery to 95 residences within a specified radial distance of the Taylor Road Landfill, and authorized the construction of County water lines to the affected areas. Further ground water investigations revealed that a plume of VOCs at concentrations exceeding the acceptable drinking-water standards established under the Safe Drinking Water Act (SDWA) was migrating off-site into residential areas. At one time, methane gas from the Taylor Road Landfill was detected near residences adjacent to the Site, in potentially explosive concentrations. In April 1980, water delivery was

expanded to 180 homes and businesses. About 400 residences and businesses were eventually connected to the County water supply.

In October 1980, EPA filed suit against the County under the Resource Conservation and Recovery Act (RCRA) and the SDWA, alleging the existence of ground water contamination from solid and hazardous waste. EPA sought injunctive relief and demanded the implementation of certain operational and remedial measures at the site. The complaint also sought the abatement of hazards caused by methane gas released at or attributable to the Taylor Road Landfill.

Because of the ground water contamination, in October 1981, EPA added the Taylor Road Landfill to the NPL of uncontrolled waste sites under the federal Superfund program. The Taylor Road Landfill received a Hazard Ranking System score of 51.37, which qualified the Site for inclusion on the NPL.

As EPA was developing administrative procedures for the newly created Superfund program, it pursued cleanup of the Site under RCRA, a previously established EPA program that, in part, controls hazardous waste management. Under a Consent Decree signed in September 1983 by EPA, FDER, and the County, the County agreed to a 30-year maintenance and environmental monitoring program governing all three landfills on County property. The decree specified requirements for the cap, cover, and drainage ditch, and for methane gas control. In February 1984, the County began installing methane monitoring wells around all three landfills in compliance with the Consent Decree, and commenced construction of a gas collection system, cap, cover, and drainage system at the Taylor Road Landfill. In addition, the County installed a water supply system to serve residents in a specified area south of the landfills, and proceeded with a routine sampling program, which is currently ongoing.

The County's routine sampling program demonstrated that VOCs continued to appear in wells around the Site. In 1986, EPA initiated a Forward Planning Study under the Superfund program to investigate all potential contaminant sources in the Taylor Road vicinity. In 1987, EPA initiated an area-wide private well sampling effort that used information gathered during the Forward Planning Study and previous studies to investigate further possible sources of contamination.

In September 1987, EPA notified Hillsborough County and Waste Management, Inc., that they were potentially responsible parties (PRPs) relative to the Taylor Road Landfill site, and informed them of their opportunity to participate in the RI/FS to be performed under Superfund. Both PRPs requested that EPA investigate additional PRPs. In addition, they asked to review EPA's ground water study before they were to conduct negotiations for the performance of the RI/FS.

In 1988, EPA contracted CDM Federal Programs Corporation (CDM) to conduct a responsible party search. Investigative activities during the next several years included the review and compiling of documents from State and County agencies and the issuing of information request letters. In July 1992, Special Notice Letters were issued to approximately 45 PRPs presenting them with the opportunity to conduct the RI/FS. In February 1993, an Administrative Order on Consent was signed by EPA and 19 PRPs.

3.0 HIGHLIGHTS OF COMMUNITY PARTICIPATION

In accordance with Sections 113 and 117 of CERCLA, EPA has conducted community relations activities concerning the Site to ensure that the public remains informed of activities at the Site.

Community concern in the Site area was noted first in 1979 by officials who received complaints

of health problems. In 1980, area residents organized in vocal protest to the County's proposal to expand landfill activities. Area residents, who subsequently formed the TRCA, complained to State and County officials that the Taylor Road Landfill had been poorly managed and that their well water had become contaminated. The TRCA filed a formal petition to FDER objecting to the landfill expansion, attended meetings of the County Board of Commissioners, reviewed reports prepared for and by the County, consulted with hydrogeologic experts, conducted public protest demonstrations, distributed leaflets to Seffner area residents, and routinely monitored the landfill activities.

A community relations plan (CRP) was developed in 1989 and revised in 1993 to establish EPA's plan for community participation during remedial activities. A primary concern of residents in the Site area continues to be current or future contamination of their drinking-water wells. They express concern that the monitor well network currently in place may not detect periodic contaminant migration, and that, given the sinkhole activity seen in the Site area, it is possible that the landfill bottoms will collapse into the aquifer and cause widespread contamination.

In December 1993, EPA approved the TRCA's application for a Technical Assistance Grant (TAG). Congress included provisions in SARA to establish the grant program to promote public involvement in the decisions made on site-specific cleanup strategies under Superfund. The TRCA has used the grant funds to hire a technical advisor to help it understand and have input into the RI/FS process. The community group's technical advisor has attended several RI/FS planning meetings and has helped the group to generate comments on draft versions of various RI/FS documents. Many of these comments have been incorporated into or considered in the final documents.

Following completion of the RI/FS, a Proposed Plan fact sheet was mailed to local residents and public officials on July 14, 1995. The fact sheet detailed EPA's preferred alternative for addressing the Site contamination. Additionally, the Administrative Record for the Site, which contains site-related documents including the RI and FS reports and the Proposed Plan, was made available for public review at the information repository located in the Thonotosassa Public Library. A notice of the availability of the Administrative Record for the Taylor Road Landfill site was published in the Tampa Tribune on July 16, 1995.

EPA held a public meeting on July 27, 1995, at the Evans Park Community Center to discuss the remedial alternatives under consideration and to answer any questions concerning the proposed plan for the Site. A 30-day public comment period was held from July 17, 1995, to August 16, 1996, to solicit public input on EPA's preferred alternative. EPA's response to each of the comments received at the public meeting or during the public comment period is presented in the Responsiveness Summary provided in Appendix A of this ROD.

4.0 SCOPE AND ROLE OF RESPONSE ACTION

Remediation at the Site will address the ground water. The Floridan aquifer is the source of drinking water for a large number of local residents. A variety of site-related chemicals pose the Site's principal threat to human health and the environment because of the risks associated with possible ingestion or dermal contact. The cleanup objectives of the selected remedy are to prevent current or future exposure to contaminated ground water through provision of County water to residents and through natural attenuation or active treatment of ground water should future conditions indicate that it is necessary.

5.0 SUMMARY OF SITE CHARACTERISTICS

The following summaries of site characteristics are excerpts or summaries of information from

the Final Remedial Investigation Report by ERM-South Inc. (ERM), which is available in the site repositories.

5.1 TOPOGRAPHY AND SURFACE DRAINAGE

The Taylor Road Landfill Study Area is located within an internally drained portion of the Polk Upland karst escarpment that has been called the Brandon Karst Terrain. The Study Area is on a small ridge that extends northward from the Brandon Karst Terrain. In the vicinity of the Study Area are sinkholes, headlands of small drainage systems, and distinctive hills that represent the accumulation of marine and coastal sands. According to U.S. Geological Survey (USGS) topographic maps, the original land surface in the quarter section that includes the Study Area extended from a low of approximately 45 ft above mean sea level (MSL) in the extreme southwestern corner to a high of slightly more than 125 ft above MSL in the small hill upon which the landfill complex has been developed.

5.2 SITE HYDROGEOLOGY/HYDROSTRATIGRAPHY

Figures 5.1 and 5.2 show the relationship of lithostratigraphy and hydrostratigraphy at the Study Area. The surficial aquifer is represented by the surficial sands elsewhere in the Brandon area. At the Study Area, however, the sands are rarely saturated, and a continuous surficial aquifer does not exist. The intermediate confining system is represented by the residual clays and sandy clays of the Hawthorn Group. Because these clays are blocky and contain pipes and limestone pinnacles, minor portions are shown to be connected to the underlying Floridan aquifer. Because the intermediate confining system is not continuous at the Site, the intermediate aquifer is considered not to be present. The Floridan aquifer consists of the Tampa Member and underlying limestones.

An approximate position of the water table is shown in Figures 5.1 and 5.2. This position is based on Hillsborough County Department of Solid Waste (HCDSW) data from September 1992. September reflects the end of the rainy season and relatively high water-table positions. The data suggest that water levels are within the clay section near the Site, and that seasonal wetting and drying of the clays occurs.

The data clearly reflect the absence of a surficial aquifer at the Study Area. The Floridan aquifer is generally unconfined or very poorly confined. The clays of the intermediate confining unit are apparently sufficiently permeable to show some hydraulic connection with the Floridan aquifer.

The potentiometric surface of the Floridan aquifer for April 1990 is depicted in Figure 5.3.

5.3 SAMPLING RESULTS

Leachate: The analytical results for leachate indicate the presence of VOCs, semivolatile organic compounds (SVOCs), one pesticide, and inorganics. These samples were collected from leachate chambers that are not accessible for exposure; therefore, the leachate results were not further evaluated in the risk assessment. However, the leachate results were used to evaluate Site sources.

Surface Water and Sediments: The analytical results for surface water and sediments taken from the Site infiltration ponds indicate that inorganics were detected in surface water, and that VOCs, SVOCs, pesticides, and inorganics were detected in sediments. The types and levels of chemicals present were determined during the RI to be typical of other stormwater retention basins in the area. Because these samples were collected from stormwater-runoff retention

basins, it is unlikely that human exposure to the basins would occur under current conditions. However, these media may be accessible for exposure under future conditions. Therefore, surface water and sediment data were evaluated during the human health risk assessment. In addition, surface water and sediment data were evaluated for potential impacts to ecological receptors.

Ground water: The ground water data selected for evaluation during the RI were generated from 12 quarterly ground water-sampling events conducted by the HCDSW from 1990 through 1992, and from sampling conducted by ERM during August and September 1993. Figure 5.4 shows the locations of monitor wells and some private wells in the vicinity of the Site. Ground water samples were analyzed for a list of parameters that included selected metals, physical parameters, nutrients, and inorganic analytes.

Data, both validated and qualified, that were reviewed are summarized in Table 5.1, which shows those organic analytes and selected inorganics that were positively identified in at least one sample. This table shows the range of detections (minimum, maximum, and average) above the sample quantitation limit (SQL), the date on which the sample producing the maximum detection was collected, the frequency of detection during each year of sampling (defined as the ratio of detections above the SQL to the number of samples collected), and the maximum background concentration levels (found in Well 27-D). The average concentration was calculated based on detections only. Figure 5.5 shows the ground water analytical results for April 1993.

Table 5.1

OCCURRENCE AND DISTRIBUTION OF CHEMICALS IN GROUNDWATER
TAYLOR ROAD LANDFILL STUDY AREA
HILLSBOROUGH COUNTY, FLORIDA

CONCENTRATION(ug/l)														
DETECTABLE ANALYTE	Minimum	Maximum	Average	Sampling Date of Maximum	Frequency of Detection(1)				Maximum in Background (Well 27-D)	Federal MCL (2)	Florida DER Groundwater Guidance (3)	USEPA Region III (4,5)		
					1990	1991	1992	1993				Risk Level =1E-06	HQ=0.1	COPC (6)
PURGEABLE ORGANICS														
1,1-DICHLOROETHANE	0.4	192	22	4/90	65/104	33/78	47/88	5/6					81	Y
1,1-DICHLOROETHENE	1	279	31	1/90	28/104	21/78	31/88	4/6	1	7	7**	0.044		Y
1,2-DICHLOROBENZENE	1	198	20	7/90	25/104	12/78	14/88	3/6		600	600**		37	Y
1,2-DICHLOROETHANE	1	3	1.9	7/91	7/104	2/78	0/88	0/6		5	3**	0.12		Y
1,3-DICHLOROBENZENE	1	3	2.0	11/91	1/104	1/78	1/88	0/6		600			53	N
1,2-DICHLOROPROPANE	1	6	2.0	7/91	13/104	7/78	11/88	1/6		5	5**	0.16		Y
1,4-DICHLOROBENZENE	1	45	5.7	4/91	26/104	20/78	13/88	3/6		75	75**	0.44		Y
CARBON DISULFIDE	2	3	2.5	11/91	0/104	2/78	0/88	0/6					2.1	N*
ACETONE	2	279	30	4/91	4/104	18/78	4/42	0/6	5				370	N
BENZENE	0.6	12	3.1	1/90	29/104	7/78	10/88	2/6		5	1**	0.36		Y
CHLOROBENZENE	1.1	5.3	3.1	10/92	4/104	4/78	7/88	1/6		100	100**		3.9	N*
CHLOROFORM	1	1	1	4/90	1/104	0/78	0/88	0/6		100	6****	0.15		Y
CHLOROMETHANE	2	2	2	8/93	0/104	0/78	0/88	1/6			2.7****	1.4		Y
DIBROMOCHLOROMETHANE	6	6	6	10/90	1/104	0/78	0/88	0/6			1****	0.13		Y
ETHYLBENZENE	1.4	18	5.7	7/91	1/104	3/78	1/88	0/6		700	700**/130***		130	Y
METHYLENE CHLORIDE	0.7	54	11	1/90	10/104	5/78	14/88	1/6		5	5**	4.1		Y
TETRACHLOROETHENE	0.8	145	23	4/90	44/104	13/78	18/88	2/6		5	3**	1.1		Y
TOLUENE	0.2	82	9	7/91	4/104	2/78	4/88	2/6		1000	1000**/40***		75	Y
rans-1,2-DICHLOROETHENE	0.3	135	32	1/90	51/104	29/78	7/88	2/6		100	100**		12	Y
cis-1,2-DICHLOROETHENE	3	45	16	8/93	NA	NA	NA	4/6		70	70**		6.1	Y
STYRENE	3	3	3	7/91	0/104	1/78	0/88	0/6		100	100**		160	N
TRICHLOROETHENE	1	180	19	10/92	56/104	28/78	43/88	4/6		5	3**	1.6		Y
VINYL CHLORIDE	1	105	24	4/90	28/104	16/78	23/88	3/6		2	1**	0.019		Y
XYLENES (TOTAL)	2	85	12	7/91	6/104	8/78	1/88	0/6		10000	10000**/20***		1200	N

SELECTED INORGANICS

ARSENIC	3.7	3.7	3.7	8/93	NA	NA	0/13	1/6		50	50**	0.038	1.1	N*
BARIUM	14.2	221	97	8/93	NA	NA	1/13	4/6		2000	2000**		260	N
CADMIUM	5	5	5	4/92	NA	NA	1/13	0/6		5	5**		1.8	N*
CHROMIUM	11	11	11	4/92	NA	NA	1/13	0/6		100	100**		3700	N
COPPER	200	200	200	1/91	0/16	1/5	0/11	0/6			1000***		140	N*
LEAD	1.3	13	4.5	4/92	NA	NA	3/13	6/6	2	15*	15*			N
MANGANESE	12.4	2380	320	8/93	5/12	2/5	6/20	3/6	311		50***		18	N*
MERCURY	0.2	42.3	4.5	7/90	60/104	12/29	27/59	0/6	2	2	2**		1.1	Y
NICKEL	40.7	95.4	68	8/93	NA	NA	NA	2/6		100	100**		73	Y
NITRATES	30	38700	5200	1/90	94/104	23/26	44/62	3/6	4460	10000	10000**		5800	N*
SELENIUM	2	2	2	8/93	NA	NA	NA	1/6		50	50**		18	N
VANADIUM	53.7	53.7	53.7	8/93	NA	NA	NA	1/6					26	N*
ZINC	10	403	64	1/91	8/12	4/5	5/13	1/6	159		5000**		1100	N

Source: CDM - BRA

OTES:

- . Frequency of detection = # of detections/# of samples.
- . MCL = Maximum Contaminant Level. * - Value for lead is an action level. EPA, December 1993.
- . Florida Department of Environmental Regulations Groundwater Guidance Concentrations. June 1994.
 - ** - Primary Standard. *** - Secondary Standard. **** - Guidance Concentration.
- . USEPA Region III - Risk-based Concentrations for lap water. January 7, 1994.
- . HQ = Hazard Quotient.
- . COPC = Chemical of Potential Concern. Y = Yes. N= No. N* = Not selected as a COPC, because the chemical was not detected or detected at a low requency in the wells selected for the risk assessment. N** = Concentrations detected in wells selected for the risk assessment did not exceed two times he background concentration.

6.0 Baseline Risk Assessment Summary

A baseline risk assessment was conducted by CDM Federal Programs Corporation for EPA. The baseline risk assessment provides the basis for taking remedial action, and indicates the exposure pathways that need to be addressed by the remedial action. It indicates the risks that could exist if no action were taken at the Site. This section of the ROD reports the results of the baseline risk assessment conducted for the Site.

6.1 CHEMICALS OF POTENTIAL CONCERN

Specific chemicals of potential concern (COPCs) were selected if the results of the risk assessment indicated that they might pose a significant current or future risk or might contribute to a significant cumulative risk. COPCs were determined for ground water as well as for surface water and sediment from the on-site surface-water-retention ponds.

COPCs for ground water were selected from the list of detected chemicals by comparing detected concentrations to federal and state drinking-water standards and guidance concentrations, action levels, EPA Region III risk-based concentrations¹, and Site background concentrations. In addition, frequency of detection also was considered. Inorganic and organic chemicals detected in ground water were selected as COPCs if their maximum concentrations exceeded federal MCLs, maximum contaminant level goals (MCLGs), and action levels; Florida Primary Drinking Water Standards; or EPA Region III risk-based concentrations for tap water. The Region III risk-based concentrations are derived for carcinogens based on a risk level of 1E-06 and for noncarcinogens based on a hazard quotient (HQ) of 1.0. Because simultaneous exposure to multiple chemicals is possible, the risk-based concentrations for noncarcinogens were adjusted to an HQ of 0.1, and these values were used in the selection of COPCs. Inorganics were not selected as COPCs if the maximum concentration did not exceed two times the background concentration. In addition, inorganics that are essential nutrients or that are normal components of human diets, such as calcium, iron, magnesium, and potassium, were excluded from consideration as COPCs. These inorganics are essential nutrients, for which no toxic effects are known at any relevant dosage level. Table 5.1 indicates the chemicals that were selected as COPCs for ground water.

Because no background samples were collected for surface water or sediment, and because no risk-based concentrations for human exposure are available, no detected compounds except essential nutrients could be eliminated as COPCs.

¹ Region III risk-based concentrations are derived for carcinogens based on a risk level of 1E-06 and for noncarcinogens based on a hazard quotient of 0.1.

6.2 HUMAN HEALTH RISKS

6.2.1 Exposure Assessment Summary

In the risk assessment, landfill waste is considered to be a chemical source, drinking water wells screened in the Floridan aquifer are considered to be exposure points, and ingestion of ground water and inhalation of volatiles released from ground water are considered to be the feasible routes for human exposure. Exposure to ground water is considered possible under both a current-use scenario and a future-use scenario. The potential receptors for the current and future scenarios are child and adult residents, and adult workers.

The pathways for leachate and surface water and sediment exposure are not considered to be complete under current conditions. Leachate collected from the collection chambers is not considered an exposure medium, because leachate chambers are enclosed and are not accessible for

exposure. As part of the site investigation, the side slopes of all three landfills were inspected for leachate seeps. No leachate seeps or areas of moist soil were observed that would indicate leachate seepage.

Sediments and surface water in the five stormwater retention basins are not likely exposure points under current conditions. The water depths in the retention basins are shallow, ranging from 0 to 3 ft, except during periods of heavy rainfall. The ponds occupy about 12 acres, and are fed by a system of concrete-lined, open drainage ditches that collect surface-water runoff.

The current-use exposure pathway was evaluated for residents and workers potentially using private supply wells. Because no current exposure to ground water occurs within the Study Area, the monitor wells that were used to assess exposures under the current-use scenario are located in the residential areas downgradient from the Study Area.

In the future, existing supply wells might become affected by the chemical plume, or new supply wells might be installed within the chemical plume within or near the Study Area. Therefore, wells near the contamination source were used to assess resident and worker exposure to ground water under a future-use scenario. Also under the future-use scenario was an assessment of potential exposure of a child resident to surface water and sediment.

6.2.2 TOXICITY ASSESSMENT SUMMARY

Toxicity assessment is a two-step process whereby the potential hazards associated with route-specific exposure to a given chemical are (1) identified by reviewing relevant human and animal studies; and (2) are quantified through analysis of dose-response relationships. EPA has conducted numerous toxicity assessments that have undergone extensive review within the scientific community. EPA toxicity assessments and the resultant toxicity values are used in the baseline evaluation to determine both carcinogenic and noncarcinogenic risks with each COPC and route of exposure.

The risk assessment draws carcinogenic and noncarcinogenic toxicity information from EPA's Integrated Risk Information System (IRIS) for each COPC to characterize site-specific risk.

6.2.3. RISK CHARACTERIZATION

In the final step of the baseline risk assessment, human intakes for each pathway of exposure are integrated with EPA reference toxicity values to characterize risk. Carcinogenic and noncarcinogenic effects are characterized separately.

To be considered in EPA's target risk range for Superfund cleanups, the increased risk of cancer to an exposed individual from COPCs should be no greater than a range from 1 additional case in 10,000 (1×10^{-4}) to 1 in 1,000,000 (1×10^{-6}). Lifetime cancer risks and noncancer risks were calculated under the current-use and future-use scenarios. The results of these calculations are presented in Table 6.1. for current exposure, carcinogenic risks all are below or within EPA's target range. However, potential future use of ground water by on-site workers or on-site residents poses unacceptable risks (i.e., risks greater than EPA's target range for Superfund cleanups).

For chemicals causing harmful effects other than cancer, EPA calculates an HQ for each COPC that is based on risks of deleterious effects caused by the chemical during a lifetime. EPA then adds the HQs for each COPC to calculate a hazard index (HI). If the HI is greater than 1, then some cleanup action may be warranted. For the current-use scenario, the HI does not meet or exceed 1. However, if contaminated on-site ground water were to be used, the HI would be greater than

1 (see Table 6.1).

For those pathways with risks exceeding 10^{-4} , the carcinogens with risks exceeding 1×10^{-6} and noncarcinogens with Hqs exceeding 0.1 are identified as "contaminants of concern", and are listed in Table 12 of the Baseline Risk Assessment.

If not addressed by implementing the response action selected in this ROD, actual or threatened releases of hazardous substances from this site may present an imminent and substantial endangerment to public health, welfare, or the environment.

SUMMARY OF CANCER AND NONCANCER RISKS BY EXPOSURE ROUTE
CURRENT AND FUTURE USE SCENARIOS
TAYLOR ROAD LANDFILL STUDY AREA
HILLSBOROUGH COUNTY, FLORIDA

HI Hazard Index
VOCs Volatile Organic Compounds
NA Not Applicable

Source: CDM - BRA

6.4 SUMMARY OF ENVIRONMENTAL ASSESSMENT

The baseline risk assessment presents a preliminary environmental assessment for the Taylor Road Landfill site. The assessment summarizes for the Study Area and vicinity, the types of habitats present, the dominant species of flora and fauna present, and any possible habitats for endangered and threatened species. In addition, the environmental assessment has qualitatively evaluated the potential effects of Site contaminants on significant receptor populations.

The Study Area is characterized primarily as disturbed grasslands containing manmade retention basins surrounded by an area of commercial/residential development containing small ponds and springs. The Study Area originally consisted of high pine, sandhill communities. Pockets of the original high pine communities remain in the vicinity of the Study Area, characterized primarily as Turkey Oak Barrens or Turkey Oak Sandhills.

Although a variety of flora and fauna may be found in the 1.5-mile radius of the area, and possibly may include-federal- and state-listed species and state species of special concern, the immediate area surrounding the three landfills is not likely to serve as a significant habitat for these species. However, wading birds, small amphibians and reptiles, and mammals may use the stormwater-runoff-retention basin as a water source and intermittent foraging area.

Metals, inorganic compounds, and organic compounds were detected in the surface water of one retention basin, and in the sediments of the retention basins--primarily in the southeastern basin. During the remedial investigation, a review of a recent USGS study of regional urban retention basins was conducted, which suggested that some of these compounds are likely to be related to non-Site sources. The maximum concentrations of a limited number of contaminants exceeded Region IV screening values for surface water and sediments. These exceedances of screening values do not necessarily equate to adverse impact, but indicate that, under a conservative evaluation, a potential for impact to pelagic aquatic biota and benthic organisms is suggested. Overall, the environmental assessment indicated that site-related compounds are unlikely to significantly affect receptors.

7.0 DESCRIPTION OF REMEDIAL ALTERNATIVES

The following alternatives for remediation were evaluated in the FS.

- Alternative 1: No Action
- Alternative 2: Prevent Human Exposure to Contaminated Ground water
- Alternative 3: Collect and Treat Ground water at Point of Compliance on a Contingent Basis
- Alternative 4: Collect and Treat Ground water at Landfill Perimeter

7.1 ALTERNATIVE 1: NO ACTION

The "no action" alternative provides a baseline for comparison with other alternatives. The "no action" assumes that no additional work will be required at the site to address the ground water. Previous work to close the landfills included construction of a cap, a cover, and a drainage ditch, and of methane-gas-control systems for all three landfills, and the implementation of long-term maintenance and monitoring programs.

7.2 ALTERNATIVE 2: PREVENT HUMAN EXPOSURE TO CONTAMINATED GROUND WATER

This alternative encompasses two broad measures to prevent human exposure to ground water having constituents in concentrations exceeding Florida drinking-water standards. In addition, this alternative relies on the natural processes of attenuation to reduce constituent concentrations. These components of Alternative 2 are described in the following sections.

7.2.1 Measures to Prevent Human Exposures Under Alternative 2

Measure 1: Use existing and future institutional controls to restrict construction of new potable-water wells that would extract water affected by the Taylor Road Landfill.

Hillsborough County owns the various properties that constitute the Study Area. Under Alternative 2, the County would use its authority to write covenants into the deeds of these properties that would restrict the County and any future property owners from constructing potable-water wells in the Study Area. For properties not owned by the County but near the Study Area, the following, very explicit, regulatory measures currently are in effect to restrict the construction of new potable-water wells:

1. the 1983 RCRA Consent Decree, which requires all new residential buildings in an area to the south of the Study Area to be connected to the County water supply; and
2. establishment in 1991 of a delineated area in accordance with FAC Chapter 62-524, which restricts the issuance of permits for new potable-water wells within an area extending 500 ft from the County property boundary.

Measure 2: Provide water from the County supply to residences surrounding the Study Area.

Under Alternative 2, water would be supplied to residents by the County. Residents would not be responsible for hookup costs or impact fees. However, residents would be responsible for water-usage fees. A detailed search would be required to locate residences south of Interstate 4 not connected to the County water supply. In addition, because hookup to County water would occur on a voluntary basis, a mechanism would be required to inform those buyers of residences whose previous owners refused to accept County water. How best to inform such buyers is a complex question, and could involve various options, including the submittal of notices accompanying annual real-estate-tax bills.

7.2.2 Contingent and Noncontingent Approaches to Prevent Human Exposures Under Alternative 2

Alternative 2 has been subdivided into the following contingent and noncontingent approaches.

Alternative 2a: Noncontingent Approach

Under the noncontingent approach, County water service would be extended in the near future to specific areas surrounding the Study Area, regardless of whether the ground water contaminant plume is enlarging. These areas would be bordered by Highway 92 to the south, Pruett Road to the north, Black Dairy Road to the west (including its projection south of Interstate 4), and a line trending from north to south, 2,000 ft east of Taylor Road. Approximately 490 residences would be connected to the County water supply under this approach. The total capital installation costs under alternative 2a are estimated to be \$4,560,000.

Alternative 2b: Contingent Approach

Under the contingent approach, County water service would be extended to replace private wells contingent upon determination that (1) the plume of contaminants exceeding Florida drinking-water standards is enlarging and that (2) those private wells would be affected by the enlarging plume. This approach would employ quarterly monitoring of a ring of wells surrounding the Study Area. Confirmation of an exceedance of Florida guidance concentrations at one of these wells would require the provision of County water service to owners of potentially threatened downgradient wells. The total capital installation costs under alternative 2b are estimated to be \$2,240,000.

A critical component of this approach is the determination of potentially threatened downgradient wells. The Feasibility Study established a 270-ft "setback" from the ring of monitor wells (Figure 7.1), which takes into account the rate of ground water migration, the time necessary to sample the monitor wells, and the time necessary to provide the owners of potentially threatened wells with County water.

This approach assumes the installation of four new monitoring wells:

- one additional monitoring well northeast of the Study Area;
- two additional monitoring wells to the south—one located approximately midway between existing wells F-3 and F-4, and one approximately midway between existing wells TR-2 and F-3; and
- one additional monitor well located between 30d and F-1.

When beginning implementation of this approach, County water would be provided to all residences within 270 ft from the monitoring ring. About 20 existing residences are estimated to be located within the 270-ft setback--about five along Mango Road to the west, about ten along Taylor Road to the east, and about five south of Interstate 4. If an exceedance were reported and confirmed, then the monitoring ring would require expansion, and the 270-ft setback also would be expanded accordingly. Residents outside the original 270-ft setback, but within the expanded setback, would be provided with the County water service. To provide County water service within the desired response time of approximately 1 month, the existing County water-supply network would require expansion before this approach is implemented.

7.2.3 Role of Natural Attenuation in Preventing Human Exposures Under Alternative 2

Florida regulations require that ground water meet drinking-water standards at the property boundary. Contouring interpolation indicates that some exceedances may be present within short distances to the south and east of the property line (Figure 7.1). Also, a parcel of privately owned property protrudes between the Taylor Road Landfill and the County-owned property around the East Basin, west of Taylor Road. A well on this private parcel (well 28d) has periodically reported concentrations of vinyl chloride above Florida drinking-water standards. This well is upgradient of the Taylor Road Landfill; vinyl chloride is present in the well as a result of the natural degradation of other organic compounds in combination with vapor-phase transport.

Natural attenuation now accounts for a decline in constituent concentrations in monitor wells along the boundary of the Study Area. To meet the applicable or relevant and appropriate requirements (ARARs), Alternative 2 relies on the degradation process, together with other attenuation processes. These processes should reduce the concentrations of organic constituents to levels that meet Florida requirements.

7.3 ALTERNATIVE 3: COLLECT AND TREAT GROUND WATER AT PROPERTY BOUNDARY ON A CONTINGENT BASIS

Alternative 3 consists of all components of Alternative 2b, plus the collection and treatment of ground water on a contingent basis from along the property boundary south of the Taylor Road Landfill. Alternative 3 also relies on the natural attenuation that now accounts for a decline in concentrations in wells along the boundary of the Study Area. However, ground water monitoring shows that this attenuation trend has reversed (that is to produce consistently increased off-site migration of contaminants exceeding the remediation goals), then extraction wells would be constructed and operated. If this were to occur, then Alternative 3 would be directed toward collecting and treating contaminated ground water. It would control ground water flow at the property boundary and would reduce concentrations of chemical constituents there to acceptable levels. In addition to implementation of the ground water collection and treatment remedy, the integrity of the landfill cover should be investigated if the attenuation trend were to reverse. The total cost of Alternative 3 if the active remediation is not required is estimated at 2,240,000 (-the same as for Alternative 2b). The total cost of Alternative 3 if active remediation is required is estimated at \$7,000,000.

7.3.1 Trend Analysis of Data to Substantiate Attenuation

Of critical importance to Alternative 3 is an ongoing analysis of attenuation trends. A determination in the future that the attenuation trend has reversed downgradient of the Taylor Road Landfill would trigger the installation and operation of the two extraction wells and the treatment system. This determination would be based on a statistical analysis of time-series data, in which trends are compared with performance criteria. The specific methods for conducting such trend analysis would be defined in the design process. One possible set of methods is found in Appendix C of the Feasibility Study.

7.3.2 Vinyl Chloride Upgradient of the Landfill

The ground water monitoring program in the Study Area frequently reports elevated concentrations of vinyl chloride in wells upgradient and crossgradient of the Taylor Road Landfill. Ground water collection at the property boundary will not address these elevated upgradient concentrations, which result from natural attenuation and vapor-phase transport. Concentrations of vinyl chloride should decline through future attenuation to acceptable levels. Remediation aimed at controlling vapor-phase transport may be necessary to reach remediation goals at the property boundary, and would require further study.

7.3.3 Control of Vapor-Phase Transport

At this time, it is difficult to determine how greatly the vapor-phase-transported constituents are affected by the existing landfill-gas-collection (LFG) system. More data are needed to determine the degree to which specific measures could control gas migration.

7.4 ALTERNATIVE 4: COLLECT AND TREAT GROUND WATER AT LANDFILL PERIMETER

This alternative is intended to comply with the CERCLA policy of compliance with Federal drinking-water standards for ground water at the outer perimeter of waste in the landfill. Alternative 4 includes all components of Alternative 2b plus collection, treatment, and disposal of ground water. Unlike Alternative 3, collection and treatment of ground water is not on a contingent basis. Continued monitoring also is included. The total present-worth cost of Alternative 4 is \$10,200,000.

7.4.1 Vinyl Chloride from Vapor-Phase Transport

Ground water collection at the landfill perimeter will not address the elevated concentrations of vinyl chloride detected upgradient of the landfill. These concentrations result from

vapor-phase transport, and should decline in the future to acceptable levels. Remediation of vinyl chloride resulting from vapor-phase transport, if necessary, would require further study.

8.0 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES

A comparative analysis was performed on the remedial alternatives developed during the FS, using the nine evaluation criteria set forth in the NCP. The advantages and disadvantages of each alternative were compared to identify that alternative achieving the best balance among the nine criteria. Evaluation criteria are defined in Figure 8.1. In the NCP, the first two criteria are labeled "Threshold Criteria," relating to statutory requirements that each alternative must satisfy to be eligible for selection. The next five criteria are labeled "Primary Balancing Criteria," and are the technical criteria upon which the detailed analysis is primarily based. The final two criteria are known as "Modifying Criteria," assessing the public's and state agency's acceptance of the alternative. Based on these final two criteria, EPA may modify aspects of the specific alternative.

A summary of the relative performance of each alternative with respect to the nine evaluation criteria is provided in the following subsections. A comparison is made between each of the alternatives for achievement of each specific criterion.

8.1 OVERALL PROTECTION OF HUMAN HEALTH AND ENVIRONMENT

All alternatives are protective of human health and the environment to varying degrees. Alternative 1 is protective under current-use scenarios, because no known points of human exposure to ground water exist having concentrations in excess of Florida drinking-water standards for constituents attributable to the Study Area. Future human exposure could occur if property in close proximity to the landfills is developed without the provision of County water.

Alternative 2 eliminates this possibility for future human exposure by using an existing institutional mechanism to prohibit new wells on this property. Alternative 2a eliminates future exposure of current population by providing for replacement of residential wells in the surrounding community with County water service. Alternative 2b offers County water to those residents whose wells would be affected in the future if the ground water constituent plume were to enlarge (as determined by quarterly monitoring).

Some limited exposure may occur to those residents immediately south of Interstate 4 who had refused connection to the County water supply, and who continue to rely on domestic wells for their water supply. However, the constituent concentrations in these areas are below Florida drinking-water standards. Alternatives 3 and 4 address this potential low-level exposure. Alternative 3 depends on natural attenuation to reduce concentrations south of Interstate 4; however, if the attenuation trend were to reverse, Alternative 3 provides for containment of the downgradient migration of constituents through use of a pump-and-treat system at the Study Area property line. Alternative 4 is the same as Alternative 3, except that it provides for collection and treatment of ground water on a noncontingent basis, and that ground water is collected along the perimeter of the Taylor Road Landfill. Alternatives 3 and 4, however, could increase the potential for sinkholes, which present unknown consequences.

Figure 8-1
GLOSSARY OF EVALUATION CRITERIA

THRESHOLD CRITERIA:

Overall Protection of Human Health and the Environment - Addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled through treatment, engineering controls or institutional controls.

Compliance with ARARs - addresses whether or not a remedy will meet all of the applicable or relevant and appropriate requirements of other federal and state environmental statutes and/or provides grounds for invoking a waiver.

PRIMARY BALANCING CRITERIA:

Long-Term Effectiveness and Permanence - refers to the magnitude of residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume Through Treatment - addresses the anticipated performance of the treatment technologies that may be employed in a remedy.

Short-Term Effectiveness - refers to the speed with which the remedy achieves protection, as well as the remedy's potential to create adverse impacts on human health and the environment that may result during the construction and implementation period.

Implementability - the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement the chosen solution.

Cost - includes capital and operation and maintenance costs.

MODIFYING CRITERIA:

State Acceptance - indicates whether the State concurs with, opposes, or has no comment on the Proposed Plan.

Community Acceptance - the Responsiveness Summary in the appendix of the Record of Decision responds to public comments received from the Proposed Plan public meeting and the public comment period and shows how the Agency used these comments to make the remedy selection.

8.2 COMPLIANCE WITH ARARS

Alternatives 1 and 2 do not address the FDEP requirement that ground water at the property line should satisfy Florida Drinking-Water standards. Continuance of natural attenuation should result in the attainment of drinking-water standards at the property line. Alternatives 3 and 4 meet the FDEP requirement for containment through natural attenuation or through treatment of ground water.

8.3 LONG-TERM EFFECTIVENESS

The amount of residuals is essentially the same for all alternatives. Alternative 3 is considered more reliable than Alternative 2 because the former provides a contingency in case attenuation trends do not continue or other increases in contaminant migration occur. Even so, the contingency is a pump-and-treat system (or equivalent innovative technology to be decided), estimated to be needed for 30 years, and perhaps for much longer. The reliability of Alternative 3 is virtually equal to that of Alternative 4, even though the pump-and-treat component of Alternative 4 is not provided on a contingent basis. This is because monitoring conducted as part of Alternative 3 would result in installation of a pump-and-treat system if and when needed. The pumping involved in Alternatives 3 and 4 could induce sinkholes, which present unknown consequences.

8.4 REDUCTION OF TOXICITY, MOBILITY, AND VOLUME THROUGH TREATMENT

Only Alternatives 3 and 4 include treatment (treatment for alternative 3 is on a contingent basis). The primary benefit of treatment is a reduction in the mobility of chemical constituents in ground water by containing them at the property line (Alternative 3) or at the landfill perimeter (Alternative 4). The treatment addresses contaminated ground water, not the landfilled waste; therefore, the relative reduction in volume of waste is minimal.

8.5 SHORT-TERM EFFECTIVENESS

Alternatives 1 and 2 do not involve any actions that would result in short-term exposure of the community to landfill gas or contaminated ground water. Alternatives 3 and 4 are confined to the Study Area, and are not anticipated to affect the community, because necessary air-pollution controls would be included with the treatment operations. Some exposures of workers could occur under Alternatives 3 and 4, which would necessitate health and safety precautions. Alternatives 2 through 4 will each require approximately 2 years to implement. For Alternatives 3 and 4, this period excludes the operational period, which could continue for about 30 years after construction.

8.6 IMPLEMENTABILITY

None of the alternatives present a serious implementability issue, except possibly any difficulty in ensuring that buyers of properties would be informed if previous owners had refused connection to the County water supply. How best to inform such buyers is a complex question, and could involve various options, including the submittal of notices accompanying annual real-estate-tax bills.

8.7 COSTS

The present-worth costs of each alternative are shown in the following list. The costs do not include the estimated future expense to the County for maintaining and monitoring the Study Area. This is budgeted at \$700,000 for 1995, yielding a present-worth cost of \$10,800,000 if

continued for 30 years. For purposes of calculating a present-worth cost, an effective discount rate of 5% was used.

The following are the comparative total present-worth costs for the alternatives (using an discount rate of 5% for 30 years).

Alternative	Cost
Alternative 1:	\$0
Alternative 2a:	\$4,600,000
Alternative 2b:	\$2,200,000
Alternative 3 (if ground water treatment is not implemented):	\$2,200,000
Alternative 3 (if contingent ground water treatment is implemented):	\$7,000,000
Alternative 4:	\$10,200,000

8.8 STATE ACCEPTANCE

This criterion assesses the technical and administrative issues and concerns that the state may have regarding each of the remedial alternatives.

The State of Florida, as represented by FDEP, has been the support agency during the RI/FS process for the Taylor Road Landfill site. As the support agency, FDEP has provided input during this process in accordance with 40 CFR 300.430. Based upon comments received from FDEP, it is expected that concurrence will be forthcoming; however, a formal letter of concurrence has not yet been received.

8.9 COMMUNITY ACCEPTANCE

This criterion assesses the issues and concerns that the public may have regarding each of the remedial alternatives. This criterion is addressed in the Responsiveness Summary (Appendix A of this document).

9.0 SELECTED REMEDY

Based upon considerations of the requirements of CERCLA, the NCP, the detailed analysis of the RI/FS, the risk assessment, and public and state comments, EPA has selected Alternative 3 as the appropriate remedy for the Taylor Road Landfill Site. Alternative 3 consists of institutional controls, provisions to prevent human exposure to contaminated ground water (as described under Alternative 2b), natural attenuation, and provisions for active treatment of ground water, or other appropriate containment methods, should future monitoring reveal that it is necessary. This section outlines the components and objectives of the selected remedy and includes several modifications and details not in the Feasibility Study or section 7.4 of this ROD.

9.1 MAJOR COMPONENTS OF THE REMEDY

9.1.1 Institutional Controls

- The use of existing and future institutional controls to restrict construction of new potable-water wells that would extract water affected by the Taylor Road Landfill

Hillsborough County owns the various properties that constitute the Study Area. The County shall use its authority to write covenants into the deeds of these properties that would restrict the County and any future property owners from constructing drinking-water wells in the Study Area. For properties not owned by the County but near the Study Area, two regulatory measures currently in effect restrict the construction of new potable-water wells. First, the 1983 RCRA Consent Decree requires all new residential buildings in the area to the south of the Study Area to be connected to the County water supply. Second, the 1991 establishment of a delineated area in accordance with FAC Chapter 62-524 restricts the issuance of permits for new potable-water wells in an area 500 ft from the County property boundary.

9.1.2 Extension of Water Lines and Monitoring

- Modification of the existing HCDSW ground water-monitoring program to include quarterly monitoring of a "ring" of existing and future monitor wells placed with the objective of defining and enclosing the area of groundwater exceeding the Florida Primary and Secondary Drinking Water Standards and Minimum Criteria

Figure 7.1 contains the wells to be included in the "ring" and is based on data at the time of the Remedial Investigation. Pursuant to FDEP comments, an additional well shall be added to the "ring" depicted in figure 7.1. This well shall be located along the western side of Taylor Road, about 2000 ft north of Sligh Ave. Additionally, recent ground water data indicates that monitor well 30d is contaminated with mercury above the 2-ppb MCL. Therefore, the "ring" outlined in Figure 7.1 may have to be expanded by adding additional wells to be monitored so that the extent of contaminants exceeding the Florida Primary and Secondary Drinking Water Standards and Minimum Criteria is further defined. The initial makeup of the monitor well "ring" shall be detailed during the project planning stages, and will consider the most recent data under the current HCDSW monitoring program. It is anticipated that at least 13 existing and future wells will constitute the "ring."

The ground water contaminants to be analyzed for shall be identified during the project planning stages and shall consist of those chemicals identified in the Risk Assessment as chemicals of concern, and of the chemicals previously detected at the site.

Trend analysis shall be planned and conducted annually on the sampling results to evaluate the temporal behavior of contaminants in ground water. Results of trend analysis shall be delivered to EPA and DEP.

The HCDSW monitoring program also shall be modified to include enhanced reporting of results to the public. Results shall be reported, after validation, in a form easy for the layman to understand, and shall be sent by Express Mail to the information repository (currently located at the Thonotosassa Public Library) and to the TRCA. All exceedances of remediation levels shall be identified in the reported results.

The described ground water monitoring shall be conducted at least as long as ground water contaminants exceed the Remediation Levels (section 9.2). However, it is

possible that future improvements in ground water quality will justify a decrease in frequency of sampling or a decrease in the number of wells to be sampled. EPA and FDEP will consider future requests for modifications of ground water monitoring program. EPA, in conjunction with FDEP, will make the final determination on whether or not the monitoring program will be modified in the future.

- Provision of County water service to human receptors within the described "ring" of monitor wells and within a "setback" that extends 270 ft outward from the "ring"

Figure 7.1 outlines a setback 270 ft from the "ring" of monitor wells. This setback takes into account the rate of ground water migration and the time necessary to sample the monitor wells and to provide owners of potentially threatened wells with County water. All residences or business that rely on well water for human consumption within the 270-ft setback shall be supplied with County water. Owners to be supplied with municipal water would not be responsible for hookup costs or impact fees. A detailed search would be required to locate residences south of Interstate 4 not connected to the County water supply. In addition, because hookup to County water would occur on a voluntary basis, a mechanism would be required to inform those buyers of residences whose previous owners refused to accept County water. How best to inform such buyers is a complex question, and could involve various options, including the submittal of notices accompanying annual real estate tax bills.

- Expansion of the County water-supply network

The purpose of this expansion of water mains is three-fold: to connect receptors within the previously described 270-ft setback, to support the institutional controls under the selected remedy, and to meet a response time of approximately 1 month for the hookup of additional receptors should an increase in size occur in the area found to exceed Florida drinking-water standards.

Under FAC 62-524.300(2), permitting the construction of new potable water wells on a property within a delineated area is prohibited where a distribution line of an available potable water system is within 500 feet of the boundary of the property. The Feasibility Study indicates that the water main surrounding the Study Area does not qualify as a distribution main, and would have to be upgraded or supplemented. Very little of the delineated area at the study area is within 500 feet of a public water distribution line, thus under current conditions the delineated area will not result in effective prevention of new potable well construction within delineated area.

- Contingent expansion of monitor well "ring"

If quarterly sampling of monitor wells in the "ring" (figure 7.1) reveals an exceedance of Florida Primary and Secondary Drinking Water Standards or Minimum Criteria, and if the exceedance is confirmed by subsequent sampling, then the "ring" shall be expanded by additional wells. Any receptors included within the expanded "ring" and 270-ft setback shall be supplied with County water.

An exceedance under this remedy shall trigger the following series of actions.

- Report sampling results to receptors in the vicinity of the affected well(s).
- Resample the monitor well.

- If confirmation sampling shows that the exceedance is still present, then:
 - a. extend the "ring" of monitoring wells beyond the area of affected ground water; and
 - b. provide County water service to owners of downgradient wells situated within 270 ft of the extended monitoring "ring."

9.1.3 Natural Attenuation with Contingent Corrective Action

EPA has defined a boundary surrounding all three site landfills at which this remedy will result in achievement of the remediation levels (section 9.2). This boundary is termed the point of compliance. The location and rationale of the point of compliance is outlined in section 9.3. Remediation levels shall be achieved at the point of compliance through one of the following means:

- Natural attenuation

Contouring interpolation indicates that some exceedances of the remediation levels (section 9.2) may be present for short distances to the south and east of the property line (See Figure 7.1). To meet remediation levels at the point of compliance, the natural degradation process is relied on, together with other attenuation processes. These processes should reduce concentrations of contaminants to meet the remediation levels.

- Contingent Corrective Action

Collection and treatment of ground water such that exceedances of the remediation levels are contained within the Point of Compliance shall be implemented if ground water data indicate that it is necessary. The monitor wells that define the Point of Compliance are identified in Section 9.3. These wells shall be monitored quarterly. If quarterly sampling of monitor wells making up the Point of Compliance reveals exceedances of Florida Primary and Secondary Drinking Water Standard or Minimum Criteria, and if the exceedances are confirmed by subsequent sampling, then a report evaluating the need for active treatment shall be submitted to EPA and FDEP. The report shall consider all available ground water data at the site including the annual trend analysis as described previously in this ROD. Such reports shall be submitted annually as long as ground water standards are exceeded at the Point of Compliance. EPA, in conjunction with FDEP, will consider the report recommendations and will make the final determination of the need for a corrective action.

If active aquifer pumping is required, then measures shall be taken during the design and operation of extraction wells to reduce the risk of inducing sinkholes.

Treatment remedies were evaluated in the RI/FS, but because rapid strides continue to be made in innovative technologies, the contingent pump-and-treat may be modified or replaced by future proposals to contain the contamination that may prove more effective. The objective of containing ground water exceeding Florida Primary and Secondary Drinking Water Standards and Minimum Criteria to within the point of compliance would remain the same.

The RI identifies a vapor-phase pathway to be responsible for elevated contaminant concentrations in ground water upgradient of the source. This pathway may need to be addressed as an additional part of any ground water containment remedy.

9.2 Remediation Levels

The purpose of this response action is to control risk posed by ingestion of and dermal contact

with ground water and to limit the migration of contaminated ground water. Potential unacceptable risk at this site is posed by a variety of VOCs and metals. The Florida Primary and Secondary Standards and Minimum Criteria shall be used as the remediation Levels for ground water. The specific concentrations to be used as remediation levels are found in "Ground water Guidance Concentrations," Florida, Department of Environmental Protection, Division of Water Facilities, June, 1994. The baseline risk assessment indicates that these remediation levels fall within the range that EPA considers protective of human health.

9.3 Location of Point of Compliance

The NCP states as a final rule that "performance shall be measured at appropriate locations in the ground water . . ." [FR 300.430(f) (5) (iii) (A)]. Discussion in the preamble of the NCP indicates that EPA policy is generally to meet remediation levels at the edge of the waste left in place (No. 46; March 8, 1990). However, the preamble continues, stating that "an alternative point of compliance may also be protective of public health and the environment under site-specific circumstances." In this case, EPA has established a Point of Compliance that surrounds all three adjacent Study Area landfills. Compliance with the remediation levels will be required at the line indicated in Figure 9.1, defined by monitor wells encircling the three landfills. As indicated in the figure, additional wells will need to be installed and monitored to assess ground water quality at the Point of Compliance.

9.3.1 Site-Specific Factors

This Point of Compliance reflects the following site-specific factors.

- It is unlikely that ground water within the Point of Compliance would be used.

Most of the area within the Point of Compliance is covered by three adjacent County landfills, the presence of which would effectively prevent the future use of ground water beneath them. Under the selected remedy, deed restrictions and other institutional controls will be in place to prevent exposure to ground water within the Point of Compliance

- The historical shrinkage of the plume and the proven stability of the area of contamination make containment pumping unnecessary at this time.

A significant amount of ground water data, spanning a period of 10 years or more, is available for area monitor wells. Trend analysis for monitor wells downgradient of the Site indicates that the area in violation of Florida drinking-water standards has shrunk significantly in recent years. Based on historic data it is anticipated that contaminant

concentrations will continue to decline in the area of the landfill.

- A consideration of cost indicates that the contingent corrective action scenario is the most cost effective.

Requiring compliance with remediation levels immediately adjacent to the landfill under Alternative 4 would cost an estimated \$10,200,000, compared with the probable cost of \$2,500,000 for the selected remedy. The protectiveness of the selected remedy is ensured through contingent ground water treatment if ground water resources outside the Point of Compliance become affected. Because the current extent of impacted aquifer is limited, and in view of the other reasons outlined herein, the significantly increased expense involved in active aquifer remediation is not justified at this time.

EPA considers the outlined Point-of-Compliance to be protective of human health when combined

with the other described components of the selected remedy.

It is possible that several of the defined Point-of-Compliance wells will contain contaminants at levels exceeding the Florida Primary and Secondary Drinking Water Standards or Minimum Criteria. Such exceedances over two quarters will trigger an evaluation of the need for a corrective action. All sampling data will be evaluated as well as subjected to trend analysis to help determine the need for an active ground water remedy. Significant natural attenuation of the ground water plume has occurred at the site in recent years. This remedy relies on the continuing degradation process to reduce the concentration of contaminants to levels that meet the Remediation Levels at the Point of Compliance.

10.0 STATUTORY DETERMINATIONS

Under its legal authority, EPA's primary responsibility at Superfund sites is to undertake remedial actions that achieve adequate protection of health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences. These specify that, when complete, the selected remedial action for this site must comply with applicable or relevant and appropriate environmental standards established under federal and state environmental laws, unless a statutory waiver is justified. The selected remedy also must be cost effective, and must use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. Finally, the statute includes preference for remedies that employ treatment technologies that, as their principal element, permanently and significantly reduce the toxicity, mobility, or volume of hazardous wastes. The following subsections discuss the ways in which the selected remedy for this site meets those statutory requirements.

10.1 Protection of Human Health and the Environment

The selected remedy protects human health and the environment through provisions to prevent human exposure to contaminated ground water by supplying County water to residents, and through provisions for active treatment of ground water if monitor well data reveals that it is needed.

10.2 Compliance with Applicable or Relevant and Appropriate Requirements

Remedial actions performed under CERCLA must comply with all ARARs. All alternatives considered for the Taylor Road Landfill site were evaluated on the basis of the degree to which they complied with ARARs. The selected remedy was found to meet or exceed the following ARARs.

Chemical-Specific ARARs

- The Safe Drinking Water Act (40 CFR 141.11-141.16, 141.50-141.51) is relevant and appropriate in development of ground water action levels. The selected remedy will achieve this ARAR, and the following chemical-specific ARARs for ground water, at the Point of Compliance (defined in Section 9.3) through two possible scenarios:
 - containment of contaminants by ground water pumping should monitoring data reveal that it is needed, and
 - natural attenuation if past attenuation trends continue.
- The Florida Primary and Secondary Drinking Water Standards and Minimum Criteria (FAC 62-550 & 520) provide maximum contaminant levels that are relevant and appropriate for

ground water.

- Florida Minimum Criteria for organoleptics, updated by FDEP's June 1994 publishing of "Ground Water Guidance Concentrations," is to be considered in the development of remediation levels for Site ground water.
- The Clean Air Act (40 CFR 50) provides National Ambient Air Quality Standards that are relevant and appropriate for emissions resulting from potential remedial activities conducted at the Site.
- Florida Ambient Air Quality Standards (FAC 17-2.3) are relevant and appropriate to remedial activities conducted at the Site that may generate air emissions.

Location-Specific ARARs

- The Endangered Species Act (50 CFR 402) is applicable to remedial activities conducted at a site located in the area of a critical habitat for endangered or threatened-species.
- The Florida Rules on Hazardous Waste Warning Signs (FAC 17-736) identify requirements applicable to signs around the perimeter and at the entrance of the Site.

Action-Specific ARARs

- Florida Air Pollution Rules (FAC 17-2.1) are applicable to remedial activities conducted at the Site that may generate air emissions.

10.3 Cost Effectiveness

EPA's selected remedy affords a higher degree of overall effectiveness in protecting the public against direct exposure and in removing the threat posed by any future release of contaminants. The most likely total-present-worth cost estimate for this alternative is \$2,500,000. If attenuation trends reverse and pumping is required to contain Site contamination, then the total-present-worth estimate would be \$7,300,000.

The selected remedy affords overall effectiveness proportional to its cost, such that the remedy represents a reasonable value for the money. When the relationship between cost and overall effectiveness of the selected remedy is viewed in light of the other alternatives, then the selected remedy appears to be cost effective.

10.4 Use of Permanent Solutions to the Maximum Extent Practicable

EPA has determined that the selected remedy is the most appropriate cleanup solution for remediating ground water at the Taylor Road Landfill site, and that it provides the best balance among the evaluation criteria for remedial alternatives considered. This remedy provides effective protection to potential human and environmental receptors in both the short and long term, and is cost effective.

SARA provides for EPA to select permanent remedies where feasible. Excavation of the landfill material is not considered feasible. The selected remedy provides for a permanent solution through prevention of exposure to contaminated ground water and, if determined necessary, through active containment of ground water.

10.5 Preference for Treatment as a Principal Element

By monitoring Site contamination and by restricting access to affected ground water, the selected remedy addresses the threat of future direct contact with, or ingestion of, contaminated ground water. However, this remedy does not satisfy the statutory preference for treatment as a principal element. Treatment of source material at a landfill (where no hot spots can be identified) is not practicable and is not EPA policy. Implementation of ground water treatment would occur if future ground water data indicates the need, and would contain ground water contamination to within the Point of Compliance.

11.0 DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Taylor Road Landfill site, which was released for public comment in July 1995, identified Alternative 3 as the preferred alternative for the Site. EPA reviewed all written and verbal comments submitted during the public comment period from July 17, 1995, through August 16, 1995.

Based upon the requirements of CERCLA section 117(b), EPA has determined that one significant change has been made to the selected remedy from the time that it was proposed in the Proposed Plan until final adoption of the remedy in this Record of Decision. The change is to the criteria to be used to determine whether or not active ground water treatment is needed. The Proposed Plan indicated that active treatment would be required if trend analysis revealed a "reversal" of trends now occurring at the site. While the trend analysis will still be important in this determination, there may be additional unforeseen factors that will also be considered. The remedy as adopted in this decision document requires an evaluation of the need for active treatment if remediation levels are exceeded in the Point of Compliance wells, and the exceedance is confirmed. Such evaluations will occur annually as long as the exceedances continue. The evaluation/s will consider the trend analysis as well as other site data. EPA and FDEP will consider the evaluation recommendations and will then make the determination of whether or not active ground water treatment is needed.

APPENDIX A

RESPONSIVENESS SUMMARY

TAYLOR ROAD LANDFILL SUPERFUND SITE

The Environmental Protection Agency (EPA) held a public comment period from July 17, 1995 to August 16, 1995 for interested parties to comment on EPA's Proposed Plan. During this comment period on July 27, 1995, EPA held a public meeting at the Evans Park Community Center. At this time, EPA representatives presented the results of the studies undertaken at the site and also EPA's preferred alternative for the site.

A summary of EPA's response to comments received during the public comment period, known as the responsiveness summary, is required under Section 117 of CERCLA. EPA has considered all of the comments summarized in this responsiveness summary in determining the final selected remedy presented in the Record of Decision.

This responsiveness summary consists of the following sections:

- A. Background of Community Involvement and Concerns: This section provides a brief history of community interest and concerns regarding the Taylor Road Landfill Site.
- B. Summary of Major Questions and Comments Received During the Public Comment Period and EPA's Responses: This section presents both oral and written comments submitted during the public meeting and public comment period, and provides the responses to these comments.

A. Background of Community Involvement and Concerns

In accordance with Sections 113 and 117 of CERCLA, EPA has conducted community relations activities at the Taylor Road Landfill site to ensure that the public remains informed concerning progress at the site.

A community relations plan (CRP) was developed in 1989 and revised in 1993 to establish EPA's plan for community participation during remedial activities. In December 1993, EPA approved the Taylor Road Civic Association's (TRCA) application for a Technical Assistance Grant (TAG). Congress included provisions in SARA to establish the grant program to promote public involvement in the decisions made on site-specific cleanup strategies under Superfund. The TRCA has used the grant funds to hire a technical advisor to help it understand and have input into the RI/FS process. The community group's technical advisor attended several RI/FS planning meetings and has helped the group to generate comments on draft versions of various RI/FS documents. Many of these comments have been incorporated into or considered in the final documents.

Following completion of the Feasibility Study (FS), a Proposed Plan fact sheet was mailed to local residents and public officials in July, 1995. The fact sheet detailed EPA's preferred alternative for addressing the ground water contamination at the Taylor Road Landfill Site. Additionally, the Administrative Record for the site, which contains site related documents including the RI and FS reports and the Proposed Plan, was made available for public review at the information repository in the Thonotosassa Public Library. A notice of the availability of the Administrative Record for the Taylor Road Landfill Site was published in the Tampa Tribune on July 16, 1995.

Attendance at the July 27 public meeting was high and many concerns and opinions were voiced. In addition EPA received written comments during the comment period. The majority of the comments indicated that a larger area should be supplied with municipal water than that outlined in the proposed remedy. Several comments indicated the need to clarify various aspects of the proposed remedy. EPA's responses to specific comments and concerns are summarized in Section B. Section 9 of the ROD incorporates several changes or clarifications to the proposed remedy which were made based on comments received during the public comment period.

A transcript of the public meeting was prepared by a certified court reporter, and this document is a part of the Administrative Record upon which the remedy selected in the Record of Decision is based.

Following the issuance of the final Record of Decision, EPA will continue to keep the community informed about progress at the site through fact sheets and informal information meetings. Additionally, documents pertaining to the implementation of the remedy will be placed in the information repository at the Thonotosassa Public Library.

B. Summary of Major Questions and Comments Received During the Public Comment Period and EPA's Responses

1. COMMENT

Of the persons that sent in written comments, approximately 21 indicated that area residents should be supplied with municipal water. Several additional commenters specified that the area to be supplied with water should be larger than that described under the proposed remedy (i.e., the area should be at least as large as what is described in alternative 2a). Four residents indicated that they were buying bottled water because they were afraid to drink their well water.

RESPONSE

During the remedial investigation, the extent of ground water contamination was determined. In addition, the area under which ground water exceeds Maximum Contaminant Levels, or contains contaminants which could pose a significant risk to human health, was defined. Under the proposed remedy all residences within this area, and within a buffer zone outward from this area, will be supplied with municipal water (an estimated 20 residences). This buffer zone provides an extra margin of safety and will help insure that the population is not exposed to site contaminants at levels posing an unacceptable risk.

The RI/FS indicated that based on historical data, the plume of contaminants under the site appears to be stable and thus is not likely to spread significantly. Monitoring will detect any expansion in the area of contaminated ground water, and the buffer zone would be expanded if necessary.

It is EPA's position that based on current site conditions, the federal government would not have the authority to require Hillsborough County and the other responsible parties to supply municipal water to a larger area than that described in the proposed remedy. To require the larger area to be hooked up, as described under alternative 2a, the data would have to indicate that the landfill poses a current threat, or a reasonable potential for a future threat, to a much larger area.

EPA's decision not to require alternative 2a is based on conditions related to the site, and is not based on factors or sources that may affect local ground water quality that are not related to the site. The site is located in the Brandon Karst Terrain, which is characterized by

internal drainage, sink holes, karst conduits, and the lack of a competent confining layer above the Floridan aquifer. Because of the geologic makeup of the area, residential wells are particularly vulnerable to both point-source and non point-source contamination. Residents in this area should receive priority under any plans that Hillsborough County has to develop its water supply network. The water line extensions required under the proposed remedy could be also be used by the County for such future development of the water supply network.

2. COMMENT

A number of verbal and written comments indicated that the residents to be supplied with water should get free water. They said that they could not afford the water, or indicated that because they did not cause the contamination that they should not have to pay for water.

RESPONSE

Under the selected remedy approximately 20 residents would be supplied with municipal water. These 20 residents would not be required to pay a hookup fee or an impact fee, but would be responsible for paying their monthly water utility fee.

3. COMMENT

A citizen expressed concern that if a sinkhole were to develop under the landfills the remedy would not prevent private wells from being contaminated.

RESPONSE

EPA's preferred alternative will be designed to detect any significant increase in contaminant migration from the study area. A buffer zone within which people will be supplied with municipal water will be established to provide an extra measure of safety. If such an unforeseen change in site conditions results in increased contaminant migration, this buffer zone would be expanded. The remedy will be designed to supply residents with municipal water before landfill-related contaminants could potentially migrate into their wells.

4. COMMENT

One commenter indicated that according to a recent Wall Street Journal article that none of the Superfund sites in the Southeast had been "cleaned up".

RESPONSE

The article did indicate that only 1 site had been "cleaned", and indicated falsely that EPA was the source of this information. There is no category for "cleaned" sites that EPA uses to track the progress of superfund sites. EPA responded to the article by providing the relevant, correct and current information to the Wall Street Journal. Of the 176 NPL sites in the southeast, 29 sites have had early actions (removals) completed, 60 sites have substantial construction work under way, construction has been completed on 44 sites, and 10 sites have been deleted from the NPL.

5. COMMENT

A citizen asked if institutional controls would prevent new drinking water wells in areas EPA felt were going to be contaminated.

RESPONSE

In January 1991, a delineated area was established under a state rule, that would prevent new potable water wells within 500 feet of the site property boundary. For the delineated area to be enforceable a water distribution line must be available in the area for residents to hook up to.

6. COMMENT

A citizen requested clarification on which wells would be sampled quarterly.

RESPONSE

All wells in the "ring" of monitor wells described under the proposed remedy will be sampled quarterly. Many additional wells are located both within and outside of the study area and have been sampled at varying intervals. The sampling frequency of these additional wells will be determined during the planning stages of the project.

7. COMMENT

One citizen inquired about how the water would be treated if the contingency pump-and-treat portion of the proposed remedy was triggered.

RESPONSE

The specific treatment process would be planned during a design process, and would depend on the concentrations in the water. The water would be passed through an air stripper and the volatile organics would go into the atmosphere. If concentrations were too high, one option would be to treat the water with activated carbon. The activated carbon would then be landfilled, incinerated, or regenerated.

8. COMMENT

A commenter indicated that choosing alternative 2a in conjunction with the proposed remedy instead of 2b would result in a significantly decreased "per-house" cost associated with supplying 490 residences with municipal water as apposed to 20 residences. The commenter calculated that the proposed remedy cost of 2.2 million dollars divided among 20 residents would cost much more per house than alternative 2a, which would supply approximately 490 residents for 4.6 million dollars.

Response

It is true that supplying the greater number of residences with municipal water would result in less money spent per-household. This is because a certain portion of the water distribution network would have to be constructed regardless of whether or 20 residences were supplied or 490 residences were supplied. Nevertheless, supplying the larger number of residents with water would cost an estimated additional 2 million dollars; a cost which EPA could not force Hillsborough County (and the other responsible parties) to pay unless it were necessitated by site conditions.

Should Hillsborough County decide to incorporate the water lines required under the proposed remedy into future plans to develop its water distribution network (i.e. to supply additional areas not required by the proposed remedy), some of the cost of the water lines would be recuperated since part of the water distribution infrastructure would already be in place.

9. COMMENT

One citizen enquired about the cost saving from the estimated cost of the proposed alternative if the County extended the water main across I-4 in conjunction with the proposals and offer to share costs made by representatives of the Lazy Days RV center. Many citizens expressed their opinion at the public meeting and in written comments that this "public-private" cooperation was a good idea and would save money.

RESPONSE

Hillsborough County is currently pursuing an agreement with representatives of the Lazy Days RV center to extend the water main across I-4. The extent to which the cost of the remedy would be reduced will depend on the negotiated agreement to share costs between the County and the private interests. EPA has outlined the objectives of the proposed remedy, but did not outline specifically how to fulfill these objectives. It is in the County's and the other responsible party's best interest to make the required extensions of the water supply network in the most efficient manner possible.

10. COMMENT

Several citizens questioned the conclusion of the Remedial Investigation that the Hillsborough Heights landfill is not contributing significantly to the ground water contamination. They questioned how contamination from the Taylor Road Landfill have seeming migrated up-gradient to areas along the western portion of the site. One commenter asked why a dye test was not run to determine which landfill/s are acting as a source.

RESPONSE

Significant effort was expended during the remedial investigation to address the question of whether or not the Hillsborough Heights Landfill is contributing significantly to the ground water contamination. When considering the many lines of investigation pursued in the Remedial Investigation, the weight of evidence indicates that the Taylor Road Landfill is the main source of ground water contamination, and that the Hillsborough Heights landfill is not contributing significantly.

There are several possible mechanisms that could explain how contaminants at the site may appear somewhat up-gradient of a source area under the Taylor Road Landfill. First, a significant network of interconnected void space exists both in the unconsolidated material above the limestone and in the limestone itself. Contaminants can migrate through these void spaces in a vapor phase and condense in up-gradient areas. Second, migration of water through conduits in the unsaturated zone is independent of the flow direction in the saturated zone and may result in contamination of the aquifer in areas up gradient of or lateral to the source. Third, when the potentiometric surface is viewed on a local scale, ground water mounding can be seen, which could result in localized contaminant migration in all directions from the source. This phenomenon was probably more pronounced before the installation of the landfill cap, when significant amounts of water could flush through the landfill and disperse in all directions.

Conducting A dye tracer study was considered during the scoping phase of the Remedial Investigation as a tool to determine if the Hillsborough Heights landfill is leaking. The possibility was rejected based, in part, on previous failed efforts to conduct dye studies in a Karst areas similar to what exists at the site.

Even considering the results of the extensive work conducted in the RI to distinguish between sources, EPA feels that it is difficult to show conclusively at this site, that the Hillsborough Heights Landfill is not a source of contamination. New evidence could reveal that it is a source. Alternatively, conditions could change at the site causing the Hillsborough Heights

landfill to begin acting as a source. The overall objectives of the proposed remedy would remain the same regardless of whether or not the Hillsborough Heights landfill is ever determined to be contaminating the ground water.

11. COMMENT

Several residents expressed concern that the County might not comply with the requirements to conduct quarterly monitoring and to deliver the results to interested parties.

RESPONSE

It will be the responsibility of EPA and DEP to enforce the requirements of the selected remedy to conduct quarterly monitoring and to send the results in a timely fashion to the information repository (now located at the Thonotosassa Public Library). It is also anticipated that a copy of sampling results will be sent to the TRCA. The parties responsible for conducting the remedy will be legally required to implement all components of the remedy.

12. COMMENT

A commenter asked why there are no monitor wells north of Pruett Road.

RESPONSE

There are fewer monitor wells north of the site because ground water does not flow in that direction. Several wells were placed in these up-gradient areas to assess background water quality conditions and to confirm that significant migration of contaminants is not occurring to the north.

13. COMMENT

A few commenters inquired as to why residents to the south of the site were supplied with water many years ago while other residents were not hooked up.

RESPONSE

Residents to the south of the site were supplied with County water because groundwater data taken during that time indicated that a plume of ground water contamination was extending downgradient to the south. More recent data has indicated significant attenuation of the plume.

14. COMMENT

One resident commented that EPA's risk assessment does not address the hospital waste buried in the landfills.

RESPONSE

EPA is not directed under CERCLA to consider hospital wastes in the Risk Assessment process. However, human pathogens are not expected to survive for long periods of time in a landfill environment since the pathogens would be outside the human body, and in competition with a host of other microorganisms. In addition, hospital wastes disposed of at the Hillsborough Heights Landfill are isolated from direct human exposure by the landfill cap and cover.

15. COMMENT

A commenter indicated that it has been taking too long for sampling results to become available to the public.

RESPONSE

The detailed reporting requirements for the sampling results will be outlined during the planning phases of the remedy. A period of approximately 60 days from the sampling date to the delivery of the results would seem appropriate. In addition, it is anticipated that public input will be sought to determine the most understandable format for the data.

16. COMMENT

One resident asked how much time a well in the "ring" has to be contaminated to trigger an expansion of the "ring".

RESPONSE

If the remediation level is exceeded for two consecutive quarterly sampling rounds, then the "ring" would be expanded and any additional residents included within the "ring" and 270' buffer zone would be supplied with municipal water.

17. COMMENT

One resident asked why well 31d was being used in the "ring" of wells to be monitored instead of well 32d. Specifically, the commenter was concerned that based on past sampling results for Mercury, detections in well 32d would not be considered.

RESPONSE

The particular wells making up the "ring" were chosen, in part, to provide consistent spacing of wells and to eliminate gaps in the monitor well "ring". The wells in the "ring" were also chosen to enclose the area exceeding the remediation levels. Mercury levels at well 32d have not exceeded the 2 ppb MCL in recent years. Well F-2 is included in the defined "ring", and is located in close proximity to well 32d. Any future elevated mercury concentration affecting 32d will most likely be detected in well F-2, and will cause the "ring" to be expanded.

18. COMMENT

What will be the screened depth and screened interval of the perimeter monitor wells to be installed?

RESPONSE

The specific design of the monitoring wells will be outlined during the planning stages of the project. Typically ground water monitoring wells have screened intervals of 10 feet. The Remedial Investigation determined that the most contaminated zone under the site is near the top of the aquifer. The wells will be screened within this zone.

19. COMMENT

Alternative 3 states that the recovery wells are to be located "at the southern boundary". What happens if the contamination migrates to the east, east or north?

RESPONSE

The feasibility study is not intended to substitute for a detailed design of the remedy, but rather to provide preliminary information on which to base remedy decisions. The statement that recovery wells would be located at the southern boundary is based on the observed ground water flow directions at the site. It would be determined during the design of a pump and treat remedy, if triggered, the specific means by which contaminants at concentrations exceeding the remediation levels would be contained within the defined point of compliance. This point of compliance encircles the site and would address the contamination no matter which direction it migrated.

20. COMMENT

Recent testing of private well P1-A has revealed levels of Mercury above the MCL. Will the users of this well be supplied with potable water, and will the monitor well "ring" be expanded?

RESPONSE

The resident nearest well P1-A and possibly other residents along Mango road appear to be within the buffer zone and thus will receive municipal water regardless of whether or not the "ring" is expanded. Recent sampling of monitoring well 30d has revealed levels of mercury slightly above the remediation level. There will be at least two additional rounds of sampling results available for monitor well 30d by the time the details of the remedy are planned and implemented. If the levels of mercury above the remediation level of 2 ppm persists in well 30d or increases in the other wells in the "ring" then the "ring" and buffer zone will be expanded.

21. COMMENT

A citizen was concerned that past data from several private wells, including P-1, P-2, and P-3 was not considered during the RI/FS, and that these wells have not been sampled recently.

RESPONSE

It was decided at during RI/FS scoping to use data no older than 1990. A monitoring well is proposed to be installed in the area of private wells P-1, P-2, and P-3. Sampling of this well will reveal if contaminant levels in that area are currently elevated, and if response actions need to be taken.

22. COMMENT

What if the private property owners will not grant "right of entry" for the placement and sampling of any needed monitor wells?

RESPONSE

This issue is common to most sites with remedies calling for significant monitoring. The steps or efforts required to gain access to private property will be outlined in future planning documents.

23. COMMENT

Who chooses which wells will be sampled quarterly?

RESPONSE

All of the wells comprising the "ring" will be sampled quarterly. The location and sampling

frequency of the remaining wells will be determined during the remedial action planning phase.

24. COMMENT

Can "reverse osmosis" units be considered for the individuals that are on bottled water now and until water lines can be provide?

RESPONSE

The remedy, once detailed during the planning phase, will include steps to supply potable water while a household is awaiting hookup to municipal water. There is no current requirement that these residents be supplied-with a reverse osmosis system.

25. COMMENT

Mercury has been detected periodically in private well P-1a and in monitoring well 30d at concentrations in excess of the 2 micrograms/liter MCL. Most recently, concentrations in well P-1a remained above the MCL from October 1994 until May 1995; however, the June 1995 sample concentration was below the MCL. The remedial investigation examined the 1990-1993 detections and concluded that the mercury did not derive from the Study Area landfills for the following reasons:

- a. If the mercury in well P-1a derived from ground water transport from the Hillsborough Heights Landfill, it would be necessary for the mercury to be in that landfill's leachate. The analysis of leachate samples did not detect mercury.
- b. If the mercury in well P-1a derived from vapor transport, it would have to correlate with the sporadic detections of VOCs in wells on the west side of the Hillsborough Heights Landfill. It did not. The mercury detections reported after 1993 (since the RI data) still do not correspond with the VOCs.

Thus, the origin of the mercury is in question. It is important to note that because the concentrations of mercury were low and sporadic over 1990-1993, the origin of the mercury was not thoroughly investigated as part of the RI. We understand that the remedial design is to locate any additionally needed monitoring wells. Their locations should be based in part on an analysis of the origin and transport mode of the mercury detected in P-1a and 30d.

RESPONSE

EPA agrees with the part of the comment indicating that the origin of the mercury is in question, but questions the assertion that the mercury is not a result of site landfilling activities. The mercury could have migrated to the western portion of the site in periods of ground water mounding. The mounding may have resulted from high rainfall events before the Taylor Road Landfill cap was installed.

Monitor well data seems to indicate that the mercury may be originating from within the study area. Wells 16d, 17d, 23d, and TR-5d have not been sampled since 1990, but showed mercury levels above the MCL that year (20.2 ppb, 20.3 ppb, 42.3 ppb, and 20.6 ppb respectively). No off-site source has been identified that would explain these-elevated levels of mercury.

The selected remedy makes the conservative assumption that the mercury is site related, and will protect human health and the environment from this contaminant. Although EPA does not find it necessary for implementation of the proposed remedy to require further study to better define

the origins of the detected mercury, EPA will consider any new information provided.

26. COMMENT

The current ground water monitoring program should be adjusted as part of the remedial design. The adjustment should accomplish the following:

- a. For governmental efficiency reasons, the adjusted monitoring program prepared under Superfund should supersede the current monitoring requirements that evolved from the September 1983 RCRA consent decree.
- b. For cost effectiveness reasons, the adjusted program should provide that the frequency of sampling and the number of analytes should be reduced commensurate with future reduction in the concentrations of contaminants.
- c. Because of the better understanding provided by the RI of ground water conditions, the frequency and scope of the current monitoring of some existing wells should be reduced such that the new wells could be sampled at no increase in total monitoring cost.

RESPONSE

The proposed remedy has been detailed in section 9 of the ROD to allow for modification of the previous monitoring program. The remedy requires that all the wells making up the "ring" will be sampled quarterly, while allowing the determination of sampling frequency of the remaining wells to occur during the project planning stage. In addition, the language of section 9 has been modified as a result of this comment to allow for a future reduction in sampling if site conditions warrant.

Although minimizing the cost of the modified ground water sampling program is important to EPA, the ability of the monitoring to identify threats to human health and the environment is of primary concern.

27. COMMENT

Ground water extraction will increase the probability of sink hole formation which could be detrimental to the integrity of the landfills and could impact adjacent infrastructure, such as I-4. Therefore, ground water extraction should only be contemplated if there is a significant increase in ground water concentrations near receptors.

RESPONSE

The proposed remedy does not require ground water extraction unless monitoring data reveals that it is needed. Measures would have to be taken during the design and implementation of any required ground water extraction to address the possible threat of inducing sink holes.

Threat to current receptors should not be the only criteria used to determine whether or not to pump-and-treat. Supplying residents with municipal water is important to protect human health, but does nothing to protect the ground water as a resource. The people of the Tampa area face a significant challenge in meeting their future ground water needs. Area municipalities may eventually need to rely on the ground water resources in the immediate vicinity of the site.

28. COMMENT

The increase in probability of sink hole formation should be the major factor in the selection of the point of compliance. The point of compliance should not prolong or trigger unnecessary ground water extraction.

RESPONSE

EPA has used the flexibility provided in the NCP to set a point of compliance surrounding all three site landfills. The point of compliance defined in section 9, along with the other provisions of the selected remedy, does not result in an unnecessary triggering of ground water extraction.

29. COMMENT

Under the "Compliance with ARARs" section of the EPA fact sheet, it is stated that alternatives 1,2 and 3 do not address the CERCLA policy that ground water at the landfill perimeter should satisfy federal drinking water standards.

EPA has identified alternative 3 as the preferred course of action. Is the CERCLA policy being waived as the result of the selection of the U.S. EPA's preferred remedial alternative 3? Can this CERCLA policy be waived? If so, why can it be waived? Would the selection of remedial alternative 4 instead of preferred alternative 3 exclude the collection and treatment of contaminated groundwater along the margin of the waste footprint for both the 10.6 FDOT Borrow Pit Landfill and the 64 acre Hillsborough Heights Landfill?

RESPONSE

Discussion in the preamble of the National Contingency Plan (NCP) (No. 46; March 8, 1990) indicates that EPA policy is generally to meet remediation levels at the edge of the waste left in place. However, the preamble continues, stating that "an alternative point of compliance may also be protective of public health and the environment under site-specific circumstances." EPA believes that factors specific to the Taylor Road site justify a point of compliance other than at the edge of the waste left in place. A detailed description of these factors and the location of the point of compliance is found in section 9.3 of the ROD. Because flexibility is provided in the NCP, a formal waiver of the general CERCLA policy is not needed.

Alternative 4, if it were selected, would require compliance with remediation levels at the edge of the Taylor Road Landfill. The RI concludes that the Hillsborough Heights Landfill and FDOT Borrow Pit are not significant sources of ground water contamination. If this conclusion is not correct, or the landfills were to begin acting as a source in the future, then alternative 4 would likely have to be modified during implementation to address the additional sources.

30. COMMENT

How long is the quarterly monitoring proposed to be continued?

RESPONSE

Monitoring of the wells will continue at least as long as contaminants associated with the site exceed the remediation levels. However, future ground water quality improvements may justify a reduction in frequency or number of wells to be monitored. Future requests to modify the initial monitoring program will be considered and must be approved by EPA (upon consultation with FDEP) before such modifications can be implemented.